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THE ENGLISH CHAPTER-HOUSE

BY

ALBERT CHARLES PHELPS, B. S., '94

THESIS

FOR THE


DEGREE OF MASTER OF ARCHITECTURE

IN THE

GRADUATE SCHOOL

UNIVERSITY OF ILLINOIS

1903



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OF Master of Architecture

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HEAD OF DEPARTMENT OF Architecture

60464

THE ENGLISH CHAPTER-HOUSE

by

Albert Charles Phelps B.S.

A Thesis

Presented to the Faculty of

THE UNIVERSITY OF ILLINOIS

for the Degree of

Master of Architecture

1903.

THE ENGLISH CHAPTER-BOOK

BY

ALBERT CHARLES BOWEN, B.A.

A THESIS

PRESENTED TO THE FACULTY OF

THE UNIVERSITY OF CHICAGO

FOR THE DEGREE OF

MASTER OF ARCHITECTURE

1928.



The chapter-house, although not exclusively an English production, was most frequent and reached its highest development in England. Originating in the Continental monastic establishments, it was introduced into England by the monastic orders and there became not only an essential part of the monasteries, but was added to nearly all the great secular cathedrals.

The early purpose of the chapter-house was to provide a meeting-place for the chapter of the monastery. Its convenience recommended it to the secular clergy and it became a common feature in the group of cathedral buildings in all parts of the kingdom. In it the meetings of the canons of the cathedral were held and secular deliberative assemblies were not excluded. Its picturesque and oftentimes artistic form added greatly to the architectural effect of the cathedral or abbey church to which it was attached, and in the development of its vaulting the highest type of Gothic structural art was reached.

The earliest chapter-houses of importance in England were built during the first half of the twelfth century, among these

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The earliest chapter-houses of importance in England were built during the first half of the twelfth century, among these

may be mentioned the chapter-houses at Durham (Fig.1) and Reading with groined vaults about thirty-five feet wide(dating from about 1150),Gloucester (Fig.2),of about the same width,still retaining its pointed barrel vault on transverse-ribs;the fine chapter-house of the Cistercian Abbey Ford in Dorsetshire(of about 1145), groin vaulted in two bays twenty by twenty-two feet,with level crown and the transverse and end wall ribs bluntly pointed; Bristol (Fig.3),similarly groined,the arches and vaults definitely pointed and the bays twenty-one by twenty-seven feet.



Fig.1. Interior of Durham Chapter-House.

(Restoration)

may be mentioned the chapter-house at Durham (Fig. 1) and Reading with groined vaults about thirty-five feet wide, dating from about 1150; Worcester (Fig. 2), of about the same width, still retaining its pointed barrel vault on transverse ribs; the fine chapter-house of the Cistercian Abbey Ford in Dorsetshire of about 1145, groined vaulted in two bays twenty by twenty-two feet, with level crown and the transverse and end walls slightly pointed; Bristol (Fig. 3), similarly groined, the apses and aisle vaults pointed and the nave twenty-one by twenty-seven feet.

Fig. 1. Interior of Durham Chapter-House.

(Restoration)



Fig.2. Plan of Gloucester Cathedral
showing Chapter-House.

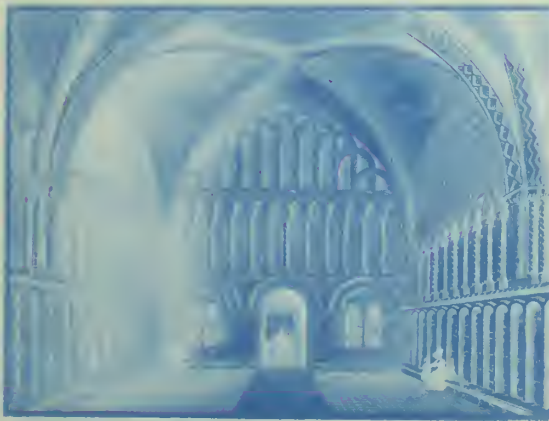


Fig.3. Interior of Bristol Chapter-House.

Fig. 2. Plan of Worcester Cathedral
showing Chapter-House.

Fig. 3. Interior of Bristol Chapter-House.

We see in these chapter-houses the widest vaulted spans of the first half of the twelfth century in England and a considerable development toward the Gothic vault of the thirteenth century.

Winchester had a chapter-house of the twelfth century, 90 by 40ft., of which but fragments remain, and that at Canterbury was rebuilt and greatly modified in the late thirteenth and again in the fifteenth century. The interior has recently been restored. See Fig.4.



Fig.4. Canterbury Cathedral from North-West showing Chapter-House.

We see in these chapter-houses the widest variety of the first half of the twelfth century in England and a considerable development towards the Gothic style of the thirteenth century.

Winchester had a chapter-house of the twelfth century, but of which not fragments remain, and that at Canterbury was rebuilt and greatly modified in the late thirteenth and again in the fifteenth century. The interior has recently been restored. See fig. 4.

Fig. 4. Canterbury Cathedral from North-West showing Chapter-house.

"The Benedictine chapter-house as it took form in England was a rectangular room about twice as long as wide, set parallel with the axis of the church and, as dictated by convenience for the cloister, either north or south of the transept from which it was separated by a narrow passage or chamber called a "slype". It usually projected in an eastern apse, by the windows of which it was lighted, while the entrance from the cloister was by a great round archway flanked on either side by round-arched, double-light-ed windows."

The Benedictine dormitory usually lay beyond or outside the immediate neighborhood of the transept, so that the chapter-house could rise to full height with no story above to suppress its ceiling. But the Augustinians and Cistercians, with their stricter habit of night service, had for convenience the dormitory immediately abutting on the transept, into which it descended by the night stair. Thus their chapter-house, though following the traditional Benedictine position, had their western porticoes lower, so that the passageway from the dormitory might pass over them. The Benedictines of Chester adopted this arrangement in rebuilding their chapter-house in the thirteenth century, and it remains excellently preserved internally. (Figs. 5-8)

"The Benedictine chapter-house as it took form in England was a rectangular room about three as long as wide, set parallel with the axis of the church and, as dictated by convenience for the cloister, either north or south of the transept from which it was separated by a narrow passage or chamber called a "rhyze". It usually projected in an eastern apse, the windows of which it was lighted, while the entrance from the cloister was by a great round doorway flanked on either side by round-headed, buttressed windows."

The Benedictine dormitory usually lay beyond or outside the immediate neighborhood of the transept, so that the chapter-house could rise to full height with no story above it to suppress the ceiling. But the Augustinians and Cistercians, with their stricter habit of night service, had for convenience the dormitory immediately adjoining on the transept, into which it descended by the right stair. Thus their chapter-houses, though following the traditional Benedictine position, had their western part lower, so that the passageway from the dormitory might pass over them. The same device as Chester adopted this arrangement in rebuilding their chapter-house in the fifteenth century, and it remains excellent preserved material. (fig. 5-8)

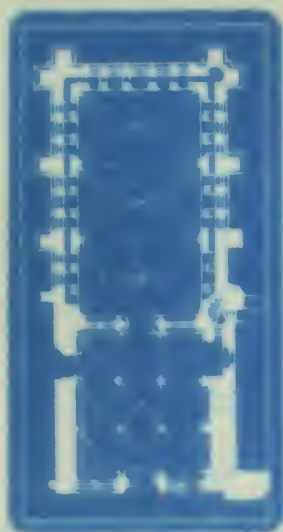


Fig.5. Plan of Chester Chapter-House.

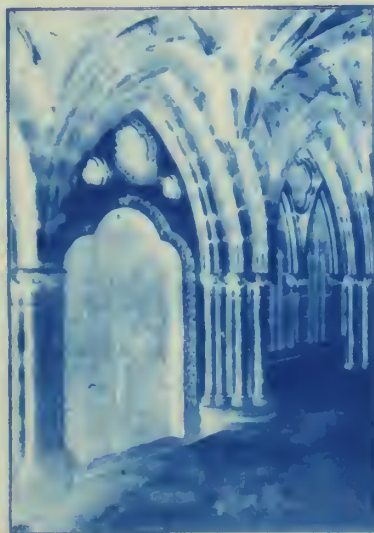


Fig.6. Entrance to Vestibule of Chester
Chapter-House.

Fig. 2. Plan of Chester Chapter-House.

Fig. 3. Entrance to vestibule of Chester
Chapter-House.



Fig.7. Vestibule of Chester Chapter-House.



Fig.8. Interior of Chester Chapter-House.

Fig. 7. Testicle of Chester Chapter-House.

Fig. 8. Interior of Chester Chapter-House.

The vestibule opens directly from the north transept, without any slype, and its three aisles, each of three bays, are vaulted to four central piers, the ribs rising from the ground, with no capitals. The triple openings into the cloister show the Norman tradition, refined and pointed, and to the east, entered from the vestibule by a similar screen, the chapter-room rises 30ft. high. It is 50ft. long and 28ft. wide, vaulted in three rectangular bays, the vaulting sharply pointed and the ribs supported upon clustered columns against the walls. The windows, triple lancets, between the piers completely fill the spandrels and five lancet windows occupy the end wall.

"But", says Prior in his History of Gothic Art in England, "it was in the hands of the Cistercians that the chapter-house had its most English development. All their convents being abbeys, with a system of visitation from the mother-house to the daughters, considerable accommodation was needed for their assemblages. In the north of England especially were noble rooms built with triple aisles of three or four bays. Few of these chapter-houses remain except in scanty ruins. Usually built after the churches, when the austerities of the first Cistercian style had been tempered by the passion for building, they exhibit steep four-part vaults upon

The vestibule opens directly from the north entrance, without any steps, and its three aisles, each of three bays, are vaulted to four central piers, the ribs rising from the ground, with no capital. The triple openings into the cloister show the Norman tradition, refined and pointed, and to the east, entered from the vestibule by a similar screen, the chapter-room rises 20 ft. high. It is 50 ft. long and 38 ft. wide, vaulted in three rectangular bays, the windows sharply pointed and the ribs supported upon clustered columns against the walls. The windows, triple lancets, between the piers completely fill the apse and five lancet windows occupy the end wall.

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slender piers, octagonal or clustered, and with their delicate carving and elaborate mouldings represent some of the earliest advances of the rich North-England Gothic. The detail of the door-ways with their flanking two-lighted openings is especially refined. (See Fig. 9, a typical plan). But all are of similar composition, and follow the Romanesque disposition as it had been at Bristol. Later in the thirteenth century this aisled planning of the chapter-house was taken south to Netley, but generally, except in the Yorkshire district, the earliest Cistercian houses seem to have followed the Benedictine arrangement of a plain rectangular vaulted room--square-ended, however, instead of apsed.

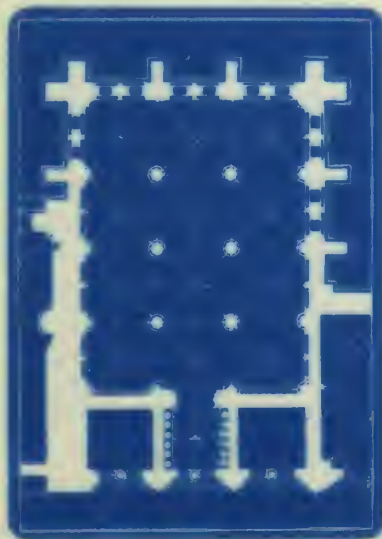


Fig. 9. Furness Chapter-House.

slender, columnar or clustered, and with their delicate arch-
 ing and sinuous outlines representing some of the earliest attempts
 of the West-Norwegian style. The detail of the door-ways with
 their flanking set-lined openings is especially refined. (See
 Fig. 6, a typical plan). But all are of inferior composition, and low
 low the Romanesque disposition as it had been at Bristol. Later
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 house was taken south to Exeter, but generally, except in the York-
 shire district, the earliest English houses seem to have followed
 the Benedictine arrangement of a plain rectangular vaulted room--
 square-ended, however, instead of apsed.

But in the west there arose another very distinctive form, seemingly in Cistercian hands, though the earliest example known is at Worcester (about 1160). Here the chapter-house is circular, nearly 60ft. in diameter, vaulted with ten ribs to a central pier (Figs.10-11).



Fig.10. Plan of Worcester Cathedral showing
Chapter-House.

But in the west there are another very distinctive form
 existing in Cistercian lands, though the earliest example known
 is at Worcester (about 1180). Here the chapter-house is circular,
 nearly 50 ft. in diameter, vaulted with ribs to a central pier

Fig. 10-11.

Fig. 10. Plan of Worcester Cathedral showing

Chapter-House.

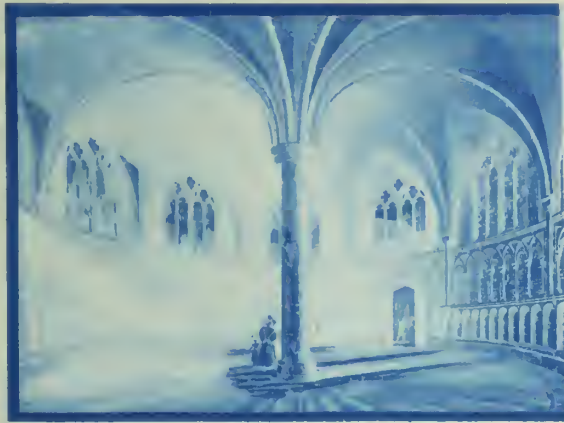


Fig.11. Worcester Chapter-House, Interior.

Almost contemporary would seem the circular chapter-house of Margam (about 1147), vaulted with twelve ribs (Fig.12), and quickly following this, that of Dore, 43ft. in diameter with twelve sides and clustered shaft.



Fig.12. Margam Chapter-House, Plan.

Fig. 11. Worcester Chapter-House, Interior.

Almost contemporarily would seem the triangular chapter-house of Worcester (about 1147), vaulted with twelve ribs (Fig. 12), and chiefly following this, that of Dorchester, in diameter with twelve ribs and clustered shafts.

Fig. 12. Worcester Chapter-House, Plan.

In the thirteenth century the idea passed to the secular canons at Lincoln, where the ten-sided chapter-house (Figs. 13-15), about 60ft. across, may possibly have been laid out by St. Hugh before 1200, though vaulted about thirty years later, when the deeply projecting flying buttresses, which give it so distinctive an exterior were probably added.



Fig.13. Lincoln Chapter-House, Plan.

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 canons at Lincoln, where the ten-sided chapter-house (Figs. 13-15),
 about 60 ft. across, may possibly have been laid out by St. Hugh
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Fig. 13. Lincoln Chapter-House, Plan.

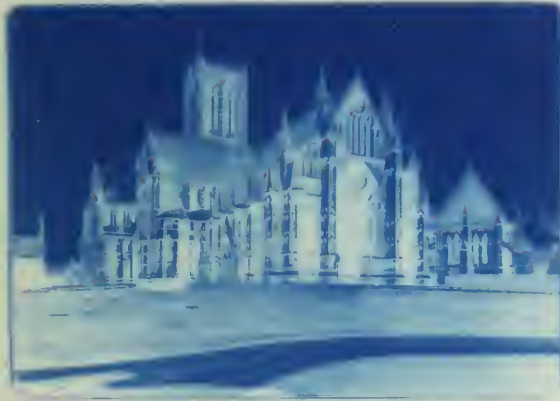


Fig.14. Lincoln Cathedral from the East
showing Chapter-House.



Fig.15. Lincoln Chapter-House, Interior.

Fig. 14. Lincoln Cathedral from the East
showing Chapter-House.

Fig. 15. Lincoln Chapter-House, Interior.

At Beverly and then at Lichfield (Figs. 16 & 17) eight-sided plans were adopted, and, after the middle of the thirteenth century, in the building of these great rooms were developed those characteristic excellencies of the English style shown at Salisbury, Westminster and elsewhere.



Fig. 16. Lichfield Cathedral showing Chapter-House.



Fig. 17. Lichfield Chapter-House, Interior.

At Beverly and then at Littlefield (Figs. 16&17) and at

plans were adopted, and, after the middle of the thirteenth century, in the building of these great rooms were developed those characteristic ecclesiastical of the English style shown at Salisbury, Westminster and elsewhere.

Fig. 16. Littlefield (Cathedral showing Chapter-Room).

Fig. 17. Littlefield Chapter-Room, Interior.

"In the polygonal chapter-house the English feeling for breadth of surface in vault and window, and for its contrast in mass of abutment, combine for a perfect Gothic achievement, which is as completely constructive and as logically satisfying as in any French building. The interpenetration of the two arts, and yet the distinct genius of each, is well illustrated in these chapter-houses, which at once come nearest in their completely Gothic suggestion to the polygonal endings of the French chevet, and yet in their origin and treatment are so characteristically English. They are at the summit of English building art at once in their Gothic as in their national quality." (Prior)

The list below gives details of the most important. They were added to nearly all the secular cathedrals during the thirteenth century, Chichester and Exeter (Fig. 18) alone remaining content with the oblong room of Benedictine tradition.

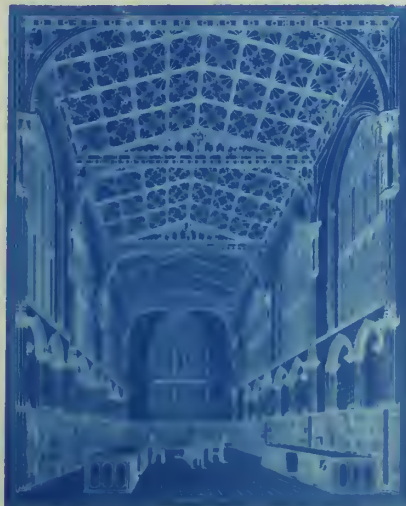


Fig. 18. Exeter Chapter-House, Interior.

"In the polygonal chapter-house the English feeling for breadth of surface in vault and window, and for its contrast in mass of sculpture, coming for a perfect Gothic achievement, which is as completely conservative and as logically satisfying as in any French building. The interpretation of the two styles, and yet the distinct genius of each, is well illustrated in these chapter-houses, which at once manifest in their completely Gothic suggestion to the polygonal windows of the French chapel, and yet in their origin and treatment are so characteristically English. They are at the summit of English building art at once in their Gothic as in their national quality." (Prior)

The list below gives details of the most important. They were added to nearly all the secular cathedrals during the thirteenth century, Colchester and Exeter (Fig. 18) alone remaining content with the original room of Benedictine tradition.

A list of polygonal chapter-houses, based upon the table in
Prior's History of Gothic Art in England, p.319.

Date--Form&Construction--Internal--W.of--Position.				
			Diameter	Bay
orcester Cath.B.	cl140	circular 10-bayed with central pier	59ft.	17ft. ordinary monastic with cloister.
argam Abbey C.*	cl180	circular 12-bayed with central pier	49ft.	13ft. ordinary monastic with cloister.
ore Abbey C*	cl180	12-sided&bayed with central pier	45ft.	12ft. ordinary monastic with cloister.
incoln Cath.Sec.	1190- 1230	10-sided&bayed with central pier	63ft.	19ft. off N.E.Transept with small clois
everly Mins.Sec.*	cl230	8-sided&bayed with central pier	31ft.	13ft. N.of Choir with crypt.
ichfield Sec.	cl240	8-sided&10-bayed with central pier	40by28ft.11&1/2	E.of N.Transept no cloister.
estminster Ab. B.	cl250	8-sided&8-bayed with central pier	62ft.	24ft. ordinary monastic with cloister.
alisbury Cath.Sec.	cl260	8-sided&8-bayed with central pier	62ft.	23ft. ordinary monastic with cloister.
ells Cath.Sec.	1260- 1290	8-sided&8-bayed with central pier	56ft.	21ft. N.side of Choir with crypt.
Southwell Sec.	cl280	8-sided with no pier	35ft.	13ft. N.side of Choir without cloister
York Cath. Sec.	1290- 1310	8-sided with no pier	59ft.	23ft. N.side of Choir without cloister
Hereford Cath.*Sec.	cl300	10-sided&-bayed with central pier	42ft.	13ft. ordinary monastic with cloister.
London Cath.*		8-sided&bayed with central pier		ordinary monastic with cloister.

* Destroyed.



Fig.19. Westminster Abbey Chapter-House, Interior.



Fig.20. Salisbury Cath. Chapter-House, Interior.

Fig. 16. Westminster Abbey Chapter-Room, Interior.

Fig. 20. Salisbury Cath. Chapter-Room, Interior.



Fig.21.Salisbury Chapter-House,Detail of Door.

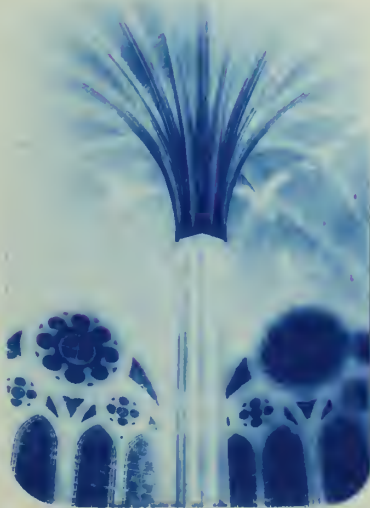


Fig.22.Salisbury Chapter-House,Vaulting.

Fig. 91. Military Chapter-house, Detail of Door.

Fig. 92. Military Chapter-house, Vaulting.



Fig.23.Wells Cath.showing Chapter-House.

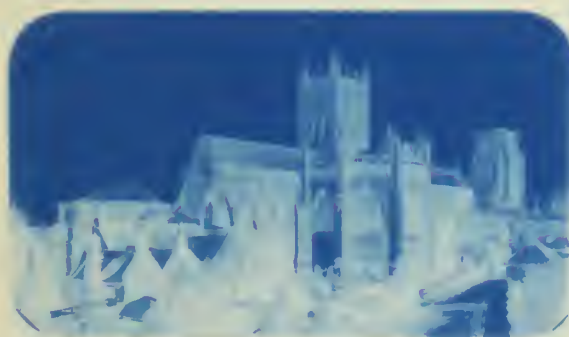


Fig.24.Wells,N.Side,showing Chapter-House.

Fig. 23. Wells Catb. showing Chapter House.

Fig. 24. Wells N. Side, showing Chapter House.



Fig.25.Wells Chapter-House,Plan.



Fig.26.Wells Chapter-House,Section.

Fig. 23. Wells Chapter House, Plan.

Fig. 24. Wells Chapter House, Section.



Fig.27.Wells Chapter-House,Interior.

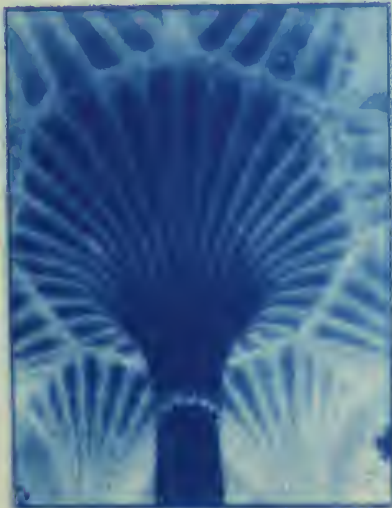


Fig.28.Wells Chapter-House,Vaulting.

Pl. 27. Wells Chapter House, Interior.

Pl. 28. Wells Chapter House, Exterior.



Fig.29.Southwell Chapter-House,Entrance.



Fig.30.Southwell Chapter-House,Details.

Fig. 32. Northwest Chapter House, Entrance.

Fig. 33. Northwest Chapter House, Interior.



Fig.31. York Chapter-House, Plan.



Fig.32. York Cath. showing Chapter-House.

Fig. 51. Top Chapter-House, Bism.

Fig. 52. Top Chap. showing Chapter-House.



Fig.33. York Chapter-House, Vaulting.

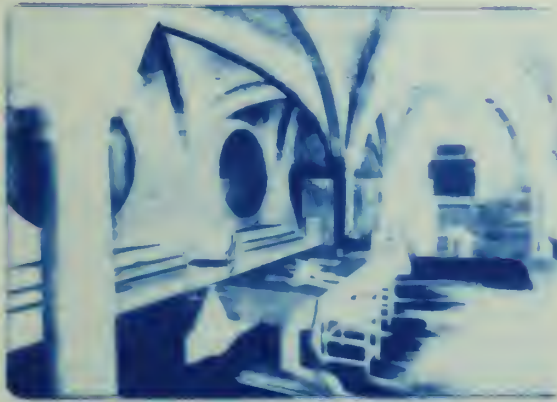


Fig.34. Ripon Chapter-House, Interior.

Fig. 33. Yorn Chapter-House, Building.

Fig. 34. Nipon Chapter-House, Interior.

With its accompanying arcaded passage this secular chapter-house is to be regarded as a great chamber of state, a palatial appendage designed to enhance collegiate dignity and make it vie with monastic consequence. As such Lincoln may have led the way with its decagonal hall, whose foundation was possibly St. Hugh's, though its vaulting came later. At Beverly perhaps was built the first octagon, which thereafter was the accepted plan. Here it was in two stories, and though now entirely destroyed, its office of state and distinction is to be seen in the elegant staircase that led from the north side of the canons' choir.

The building at Westminster was in the form of a state apartment, superceding the original Benedictine hall, and one side of the old pent house cloister, the king designing it magnificently as an adjunct for his palace as well as for the uses of the monastery. And so, too, Salisbury received the idea, making stately garth as well as chapter-hall, in the latter being followed by Wells, York and Southwell. These last two dispensed with the central pier, but the groining of York was only in wood, and the Southwell hall is but half the size of the greater pillared chapter-houses.

With its accompanying attached passage this secular chapter-house is to be regarded as a great chamber of state, a palatial apartment, designed to enhance collegiate dignity and make it vie with secular magnificence. As such Lincoln may have led the way with its decorative hall, whose foundation was possibly St. Hugh's, though its existing form later. At Beverly passage was built the first octagonal, vision thereafter was the octagonal plan. Here it was in two stories, and though now entirely destroyed, its office of state and distinction is to be seen in the elegant staircase that led from the north side of the canon's choir.

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At this time or later, many of the monks or canons adopted the secular polygon, but few of these chapter-houses have come down to us unless attached to the cathedrals. Of the great chapter-houses of the thirteenth century that remain, that at Lincoln has been recently restored, and that at Westminster is externally nothing but the work of Sir Gilbert Scott. But though their ancient charm has gone, and we see them now only as good specimens of imitative Gothic, there is still in the character of their broad English designing evidence of the native vigor of the middle thirteenth century ideal. "Very widely and finely do they plant the bases of their expression--those weathered and sloping flying buttresses which contrast with the scaffold-like erections of the contemporary French construction." (Prior)

Salisbury chapter-house has less of this English power, but internally the charm is fully that of Westminster. In their window design and in their vaults both Salisbury and Westminster are less indicative of the English feeling than the northern and western examples. At York and Wells, as at Lincoln, the chapter-houses are of two periods, being completed about thirty years after they were laid out. Neither has been greatly changed by time or restoration,

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and we can still see much of the genuine Gothic inspiration. The external shapeliness of York(Figs.31-33),its pillarless spaciousness,make a remarkable impression,and its walls and wooden ceiling are richly detailed with the romantic profusion of the fourteenth century.And yet,exquisite as is their handling, such arcades and vaults appear to have overstepped the point in art when its display is unconscious and natural.

Wells chapter-house(Figs.23-28)was by some twenty years earlier,and we can turn to it with the surer impression that we have here an ideal building in the center of the English style, exhibiting its essence and quality. Passing into it from the picturesque stairway,which its under story made necessary,we can note how its canopied arcades,wide windows with the lancet tracer-ies of central England, and richly branched vaults,sum up the tendencies of the central phase of English Gothic. "Midway between the lava-like out-pouring of the earliest Gothic eruption and that slow crystalization of form which slowly yielded up its heat to the last Gothic phase,there can be traced here neither the first crudeness nor the latest mannerisms,and middle,too,in point of place and style among the works of its time, it is just half way

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The external appearance of York (Figs. 81-83), its pillars

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slow crystallization of four years slowly gleamed up its heat to

the last Gothic phase, there can be traced here neither the first

orderness nor the infant uncertainties, and while, too, in point of

place and style among the works of the time, it is not half way

between the superb stateliness of the Yorkshire manner and the sunny, romantic grace of the southern. And in this sense we may read its position at the summit of English Gothic inspiration: that as an architectonic whole, its effect is to make the earlier efforts of Gothic interior seem somewhat empty, and the later somewhat tawdry. Yet it is to be observed that in the building, exceedingly beautiful and unsurpassed as it is, figure sculpture has no part, and that, too, in the house of the greatest school of English sculpture, Wells itself".

In these chapter-houses we can trace the systematic and logical development of vaulting, from the simple semicircular groined vaulting of Durham to the elaborate and artificial construction at York. The tendency in the polygonal buildings seems to have been toward the development of a true Gothic dome, which was approximated most closely in form, but not in material, in the vaults of the York chapter-house and the octagon at Ely. The ideas incorporated were novel and vigorous, and it is greatly to be regretted that the logical result was not attained.

In the treatment of the polygonal vault with the central pier two distinct lines of reasoning were followed: in the one the vault was assumed to span from the sides of the polygon to the cen-

between the superlativeness of the Gothic manner and the sunny, romantic grace of the southern. And in this sense we may find its position at the summit of English Gothic inspiration: that as an architectural whole, its effect is to make the earlier efforts of Gothic inferior seem somewhat empty, and the later somewhat tawdry. Yet it is to be observed that in the building, exceedingly beautiful and unsurpassed as it is, there is no part, and that, too, in the house of the greatest school of English sculpture, which is not "Gothic".

In these chapters, however, we can trace the systematic and logical development of building, from the simple rectangular column to the variety of forms to the elaborate and artificial construction as found. The tendency in the polygonal building seems to have been toward the development of a true Gothic dome, which was approximated most closely in form, but not in material, in the vaults of the four chapter-house and the polygon at Ely. The ideas incorporated were novel and vigorous, and it is credit to be rewarded that the logical result was not attained.

In the treatment of the polygonal vault with the central pier two distinct lines of reasoning were followed: in the one the vault was assumed to span from the sides of the polygon to the can-

tral pier, in the other, from the angles to the pier. (Fig.35)



Fig.35.

The former appears at first to be the more natural, but has the disadvantages of breaking the principal side of the vaulting compartment that rises from the corners into a resalient angle, and also making the main ribs from these angles across to the central pier, in half their length diagonal ribs, and in the other transverse, and of making one half represent a projecting and the other a receding angle, while the angle ribs of the outer half meet the transverse ribs of the inner half of the vault.

These objections are entirely obviated by supposing the main vaults to run directly from the angle to the pier. In either

trial piston, in the center, from the engine to the piston.

Fig. 25.

The former appears at first to be the most natural, but the direct-connection of the piston with the crank is the most convenient, and also saving the main axis from these engine actions to the central gear, in half length diagonal line, and in the other transverse, and of which the half represents a projection and the other a receding axis, while the main axis of the outer half next the transverse axis of the inner half of the shaft.

These objections are entirely avoided by supporting the main axis to run directly from the engine to the gear. In which

case the ridge that surrounds that half of the vault that springs from the central pier takes the form of an inner octagon. In the first case the sides of this are parallel to the walls, while in the second they take an intermediate direction, the angles of the inner octagon being opposite the centers of the outer one.

The vaulting compartments that rise from the angles of the great octagon are exactly like those that rise from the central pier, and the ribs that rise from the angles to the pier are throughout transverse ribs, while the angle ribs from each side regularly meet one another.

This latter method of vaulting was the one adopted in nearly all the finer structures, as Westminster, Salisbury, Lincoln and Wells, while at York the inner octagon is parallel with the outer one, but the difficulties are avoided by dispensing with the central pier.

As Sir Gilbert Scott has said in his Lectures on Mediaeval Architecture: "Few forms, in fact, in any style of architecture present such beauties as an octagon vaulted in this manner."

case the right hand movements that result of the unit that episode from the central pier takes the form of an houry octagon. In the first case the sides of this are parallel to the walls, while in the second, they take an intermediate direction, the angles of the houry octagon being opposite the centers of the pier one.

The existing octagons that rise from the angles of the great octagon are exactly like those that rise from the central pier, and the rise from the angles to the pier are throughout intermediate rise, and the angles rise from each side regularly meet one another.

This latter method of vaulting was the one adopted in nearly

all the finer structures, as Westminster, Salisbury, Lincoln and Wells, while at York the houry octagon is parallel with the outer one, and the difficulties are avoided by disposing with the central pier.

As Sir Gilbert Scott has said in his lectures on Salisbury Cathedral: "The tower, in fact, is any style of architecture present with beauty as an octagon vaulted in this manner."

Although built as adjuncts of greater structures, and in a measure overshadowed by the greater glories of the churches to which they are joined, there is a unity and directness of purpose about them rarely to be found in the larger buildings.

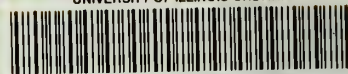
England has produced greater structural works and more imposing architectural monuments, but nothing more unique and spontaneous than her chapter-houses.

Algebra built as adjuncts of greater structures, and in a
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 about them rarely to be found in the latter college.
 In fact one profounder general structural unity and more
 important mathematical connections, but within some minor and spor-
 taneous than our simpler houses.

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